Technical Approval

SINTEF Building and Infrastructure confirms that

Eurofast Fastening System

has been found to be fit for use in Norway and to meet the provisions regarding product documentation given in the regulation relating to the marketing of products for construction works (DOK) and regulations on technical requirements for building works (TEK), with the properties, fields of application and conditions for use as stated in this document

1. Holder of the approval

Würth Danmark A/S
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2. Manufacturer

Van Roij Fasteners Europe BV, DK Deurne, Netherland

3. Product description

Eurofast Fastening System is a system for fastening of roof membranes to an underlay of steel plates, and consists of a plastic plug and corresponding screw. Eurofast fastening plug TLK Ø45, see fig. 1, is made of injection moulded modified polypropylen.

The fastening plug is fastened to the underlay of steel plates with Eurofast Roofing Screw EDS-B-48, see fig. 2. The screw is made of organic coated steel.

4. Fields of application

Eurofast Fastening System is used for mechanical fastening of bituminous and polymeric roofing membranes on flat, compact roofs with a supporting construction of steel plates.

5. Properties

Fastening capacity

Table 1 shows capacity for fastening in various roofing membranes. Table 2 shows the pullout capacity of screws fastened in steel plates.

Corrosion protection

Eurofast Roofing Screw EDS-B-48 has corrosion protection corresponding to application category KLA as defined in Building Research Design Guide no. 544.206, which corresponds to corrosion protection according to ETAG 006, cl. 5.3.7 Annex D, 15 Kesternich-cycles.

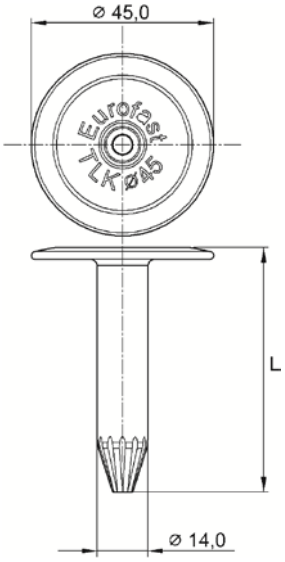

Fig. 1
Eurofast fastening plug TLK Ø45

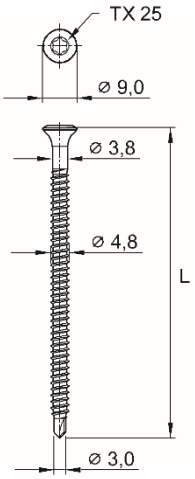

Fig. 2
Eurofast Roofing Screw EDS-B-48

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Table 1
Design axial capacity in ultimate limit state for Eurofast TLK Ø45 for fastening in various roofing membranes[1)]

Roofing	Design capacity (N/fastener)
Single layer bituminous membranes	
Phønix Sveiseunderlagsmembran PF 3500 SBS	800
Phønix Sveiseunderlagsmembran PF/GF 3500 SBS	850
Phønix Sveiseunderpapp PF 2800 SBS	850
Phønix takbelegg Type F	800
Icopal Base 511PG (DK)	850
Icopal Base 411PG (DK)	850
Icopal Base (Malmø)	850
Icopal Mono PC	750
Binne PF 3000	500
Deboer PF/GF 3000 SBS T/F	800
Derbicolor	650
Derbigum SP FR	650
EshaFlex Top Mono N PG 5000	800
Isola Mestertekk	550
Technoelast K-MS 1 170/3000	550
Technoelast K-YS 5500	650
Double layer bituminous membranes	
Phønix double layer with Sveiseunderlagsmembran PF/GF 3500 SBS	800
Icopal double layer with Icopal Base 511 PG produced in denmark	750
PVC membranes	
Protan SE 1,2 roofing membrane	700
Protan SE 1,2 roofing membrane with flap	1000
Icopal Monarplan FM EM	750

[1)] The given design capacities shall be used both when the test results are given according to NT Build 307, ETAG 006 and EN 16002 when a national safety factor of 1,3 is used for Norwegian conditions

Table 2
Design capacity in ultimate limit state for Eurofast Roofing Screw EDS-B-48, 4,8 mm plate screw in steel plates

Plate thickness (mm)	Design capacity (N/plug)
0,75	830

Safety against self-unscrewing

Eurofast Roofing Screw EDS-B-48 has been tested for safety against self-unscrewing, and is considered safe in use.

Application properties

Eurofast Fastening System has been evaluated as being acceptabel for use under the following conditions:
- Installation at air temperatures down to -20 °C.
- Oblique loading when fastened at the edge of membrane sheets or at flaps.
- Impact resistance at loads from movements in the membrane.
- Torch-on welding and moderate drying of asphalt roofing membrane
- Durability when applied together with PVC roofing membranes and bitumenous roofing membrane.

6. Environmental aspects

Substances hazardous to health and environment

The product contains no hazardous substances with priority in quantities that pose any increased risk for human health and environment. Chemicals with priority include CMR, PBT or vPvB substances.

Effect on soil, surface water and ground water

The leaching properties of the product are evaluated to have no negative effects on soil or ground water.

Waste treatment/recycling

The product shall be sorted as residual waste on the demolition site. The product shall be delivered to an authorized waste treatment plant for disposal.

Environmental declaration

No environmental declaration (EPD) has been worked out for the product.

7. Special conditions for use and installation

Calculation of fastening numbers shall be carried out as shown in Building Research Design Guide no. 544.206 or in "TPF Informerer nr. 5" (TPF Informs no. 5), based on the design capacity in Table 1 and 2. The lowest value in Table 1 and 2 shall always be used.The values are valid for Norwegian conditions with load factor γ_f = 1,5 and reduction factor k_L = 0, 9 for reliability class 1 according to NS 3490.

It is generally recommended that the plate thichness is minimum 0, 7 mm when the roofing membrane is fastened to steel plates. In particularly exposed areas the recommended minimum thickness is 0, 8 mm. On site pullout tests should be performed in cases of re-roofing where it may be difficult to assess the quality of the substructure.

8. Factory production control

Eurofast Fastening System is subject to supervisory factory production control according to contract with SINTEF Building and Infrastructure concerning Technical Approval.

Würth Danmark A/S has a quality system certified by Det Norske Veritas according to ISO 9001, certificate no. 29274-2008-AQ-DEN-DANAK.

9. Basis for the approval

Fastening capacity in roofing membranes

The fastening capacity in various roofings is based on test results from wind load tests according to method Nordtest NT Build 307 and EN 16002. The test results are documented in

- SINTEF Building and research institute, report B21965 dated 31.03.2009
- SINTEF Building and research institute report 102000544-2 dated 20.01.2015

Fastening capacity in the underlay

Fastening capacity in steel plates is based on test results according to ETAG 006 § 5.3.4.1. The test results are documented in

- INTRON Certificatie B.V., report BU2005-23395-RWo dated 29.11.2005

Durability

The corrosion protection for plug and screw has been tested according to ETAG 006 § 5.3.7.1 The test results are documented in

- INTRON Certificatie B.V., report BU2005-23395-RWo dated 29.11.2005

Eurofast Fastening plug TLK Ø45 has been tested with respect to durability in use together with bitumenous roofing membrane and polymeric roofing membrane, and is documented in

- SINTEF Building and research institute, report B21965 dated 21.11.2008

10. Marking

The fastening plug shall be marked with approval holder's product name. Eurofast Roofing Screw has "EF" headmarking. All packages are marked with product designation and time of manufacture. SINTEF's approval mark for SINTEF Technical Approval No. 2607 may also be applied.

Approval mark

11. Liability

The holder/manufacturer has sole product responsibility according to existing law. Claims resulting from the use of the product cannot be brought against SINTEF beyond the provisions of Norwegian Standard NS 8402

12. Technical management

Project manager for this approval is Noralf Bakken, SINTEF Building and Infrastructure, dep. Trondheim.

for SINTEF Building and Infrastructure

Hans Boye Skogstad
Approval Manager